

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 32

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte AHMAD SADJADIAN
and JONATHAN JAMES STONE

Appeal No. 2002-1510
Application No. 08/882,625

ON BRIEF

Before THOMAS, RUGGIERO, and LEVY, Administrative Patent Judges.
LEVY, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1-5, which are all of the claims pending in this application.

BACKGROUND

Appellants' invention relates to motion predicted image signal compression. An understanding of the invention can be derived from a reading of exemplary claim 1, which is reproduced as follows:

1. A motion predictive inter-frame image signal compression system, comprising

means for transforming image data, which includes a plurality of groups of pictures, from one of a space domain and a frequency domain into a plurality of data bands in the other domain,

means for operating in said one domain to produce motion vectors,

means for converting the motion vectors from said one domain into motion vectors for one of said bands, said image data of said one domain corresponding to a higher resolution than the data of said one of said bands; and

means for allocating a target compressed-data bit rate to pictures or blocks of pictures of a current group of pictures according to a ratio of an amount of data generated during an intra-frame coding of a prior group of pictures and an amount of data generated during an inter-frame coding of said prior group of pictures.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Tourtier et al. (Tourtier)	5,446,495	Aug. 29, 1995
Lee et al. (Lee)	5,565,920	Oct. 15, 1996
Pecot et al. ¹ (France Patent Application)	2 654 887 A1	May 25, 1991

Claims 1-5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Pecot in view of Lee.

¹ Although the examiner relies upon the summary of Pecot found in U.S. Patent No. 5,446,495, to Tourtier, we rely upon the PTO translation of Pecot, a copy of which is enclosed with the decision.

Rather than reiterate the conflicting viewpoints advanced by the examiner and appellants regarding the above-noted rejection, we make reference to the examiner's answer (Paper No. 22, mailed August 21, 2001) for the examiner's complete reasoning in support of the rejection, and to appellants' brief (Paper No. 21, filed June 7, 2001) and reply brief (Paper No. 23, filed December 12, 2001) for appellants' arguments thereagainst. Only those arguments actually made by appellants have been considered in this decision. Arguments which appellants could have made but chose not to make in the brief have not been considered. See 37 CFR 1.192(a).

OPINION

In reaching our decision in this appeal, we have carefully considered the subject matter on appeal, the rejection advanced by the examiner, and the evidence of obviousness relied upon by the examiner as support for the rejection. We have, likewise, reviewed and taken into consideration, in reaching our decision, appellants' arguments set forth in the briefs along with the examiner's rationale in support of the rejection and arguments in rebuttal set forth in the examiner's answer.

Upon consideration of the record before us, we reverse, for the reasons set forth by appellants, and add the following comments. We turn to the rejection of claims 1-5 as being unpatentable over Pecot in view of Lee.

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the examiner to establish a factual basis to support the legal conclusion of obviousness. See In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the examiner is expected to make the factual determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and to provide a reason why one having ordinary skill in the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. Such reason must stem from some teaching, suggestion or implication in the prior art as a whole or knowledge generally available to one having ordinary skill in the art. Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir. 1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985); ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). These showings by the examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. Note In

re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). If that burden is met, the burden then shifts to the applicant to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole. See id.; In re Hedges, 783 F.2d 1038, 1039, 228 USPQ 685, 686 (Fed. Cir. 1986); In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984); and In re Rinehart, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976).

We observe at the outset that both the examiner (answer, page 5) and appellants (brief, page 8) agree that Pecot does not disclose "means for allocating a target compressed data bit rate to pictures or blocks of pictures of a current group of pictures according to a ratio of an amount of data generated during an intra-frame coding of a prior group of pictures and an amount of data generated during an inter-frame coding of said prior group of pictures," as recited in claim 1. In addition, we observe that appellants do not contest the combinability of Pecot and Lee, but rather assert (brief, page 5) that Lee does not disclose "means for allocating a target compressed-data bit rate to pictures or blocks of pictures of a current group of pictures according to a ratio of an amount of data generated during an intra-frame coding of a prior group of pictures and an amount of data generated during an inter-frame coding of said prior group

of pictures" as advanced by the examiner (answer, pages 5 and 6).

Appellants assert (answer, page 5) that "Lee discloses that within a GOP, the number of bits for a current frame of a given type (D_t) is computed by multiplying the bits for the prior frame of the same type (X_t) by a ratio for the target bit rate for the GOP (T_{GOP}) to the expected bit rate for the GOP (E_{GOP}). That is, Lee relates a frame within a GOP to a prior frame within the same GOP. Thus, the issue before us is whether Lee teaches or suggests "means for allocating a target compressed-data bit rate to pictures or blocks of pictures of a current group of pictures according to a ratio of an amount of data generated during an intra-frame coding of a prior group of pictures and an amount of data generated during an inter-frame coding of said prior group of pictures," as recited in claim 1. The examiner's position (answer, pages 5 and 6) that:

Lee teaches means for allocating a target compressed-data bit rate to pictures of a current group of pictures according to a ratio of an amount of data generated during an intra-frame coding of a prior group of pictures and an amount of data generated during an inter-frame coding of the prior group of pictures. (Column 35, lines 12-39; [sic,].) The target bit rate allocation D_t is given by

eq.36, where t is one of I1, I2, P1, P2, and B. As a consequence $D_{I1}/D_{P1}=X_{I1}/X_{P1}$, X_{I1} and X_{P1} are the numbers of the generated bits for the previous frame of the type I1 (intra-frame coding) and P1 (inter-frame coding), respectively. The target-bit rate in a GOP is thus allocated according to the ratio recited in Claim 1.).

From our review of Pecot and Lee, we agree with the examiner that Lee discloses allocating a target bit rate to picture data of a current group of pictures (GOP). However, we find from the disclosure of Lee (col. 35, lines 12-39) that:

Within a GOP, the target bit allocation for each picture type is also allowed to vary to be adaptive to the changing scene complexity of the actual video sequence. The number of bits generated for the previous picture having the same picture type is used as the target bit allocation. When the number of bits produced for one frame deviates from the target number of bits, the bit allocation for the next picture is adjusted to maintain an acceptable range of bit rate according to the equation:

$$D_t = X_t \times \frac{T_{GOP}}{E_{GOP}}$$

where t is a picture type, with $t \in \{I1, I2, P1, P2, B\}$, D_t , is target bit allocation for picture type t , X_t , is the number of generated bits for the previous frame of the type t , E_{GOP} is the expected GOP bit rate computed by the most recent data of bits generated for each frame type, and G_{GOP} is the target GOP bit rate T_{GOP}

is computed by $M(R/30)$, where M is the GOP size and R is the target bit rate (bits/sec). E_{GOP} can be computed by the equation:

$$E_{\text{GOP}} = \sum_{t \in A_{\text{GOP}}} n_t X_t$$

where A_{GOP} is the set of all picture types used in the current GOP, n_t is the number of the frames of picture type t in the GOP, and X_t is either the generated bits for the previous frame of the type t or the initial bit allocation for picture type t when the picture is at the beginning of a GOP.

From the disclosure of Lee, we find that Lee refers to allocating target bits within a GOP, based upon the generated bits for the previous frame of the same type, within the GOP, or based upon an initial bit allocation for a picture type when the picture type is at the beginning of a GOP. Thus, we agree with appellants (brief, pages 5 and 6) that Lee relates a frame within a GOP to a prior frame within the same GOP.

We are not persuaded by the examiner's assertion (answer, pages 6 and 7) that Lee discloses (col. 35, lines 37-39) "'and X_t is ... the generated bits for the previous frame of the type t ... when the picture is at the beginning of a GOP,'" and that "[i]t is very clear that because the X_t values exist at the beginning of a GOP, the X_t values are values related to the prior GOP." We find that the full quote (paraphrased by the examiner)

disclosed by Lee (col. 35, lines 37-39) is that " X_t is either the generated bits for the previous frame of the type t or the initial bit allocation for picture type t when the picture is at the beginning of a GOP."

We find (col. 35, lines 7-11) that the X_t values that exist at the beginning of a GOP are not related to a prior GOP, but rather that when the picture is at the beginning of a GOP, an initial bit allocation for the picture type is updated at the beginning of each GOP using equation 30 (col. 21, lines 45-51) where "the following formula for target bit allocation results:

$$D_t = C_t \frac{R}{2(C_{I1} + NC_{P1} + (M - N - 1)C_{B1})}$$

This bit allocation is updated by use of equation (30) at the beginning of each GOP." Lee further discloses (col. 21, lines 32-39) that "[t]o describe the algorithm, let the channel bit rate (bits/sec) be denoted by R , GOP size by M , expected GOP bit rate by G , and target bit allocation for picture Type t by D_t . The bit allocations for $I1$, $I2$, $P1$, $P2$, and $B1$ frames:

$D_{I1} = C_{I1}x$, $D_{I2} = C_{I2}x$, $D_{P1} = C_{P1}x$, $D_{P2} = C_{P2}x$, $D_{B1} = C_{B1}x$, respectively, where x is a common factor and C_{I1} , C_{I2} , C_{P1} , C_{P2} , and C_{B1} are constants

for I1, I1, P1, P2, and B1 frames, with $C_{I2}=C_{P2}=C_{B1}$." We add (col. 21, line 22) that N represents the number of reference frames. From the disclosure of Lee, we find that the initial bit allocation for the picture type, derived from equation 30, does not relate to a prior GOP, as advanced by the examiner, and does not provide for "means for allocating a target compressed data bit rate to pictures or blocks of pictures of a current group of pictures according to a ratio of an amount of data generated during an intra-frame coding of a prior group of pictures and an amount of data generated during an inter-frame coding of said prior group of pictures," as recited in claim 1.

From all of the above, we find that the examiner has failed to establish a prima facie case of obviousness of claims 1-5. Accordingly, the rejection of claims 1-5 under 35 U.S.C. § 103(a) is reversed.

CONCLUSION

To summarize, the decision of the examiner to reject claims 1-5 under 35 U.S.C. § 103(a) is reversed.

REVERSED

JAMES D. THOMAS)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
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)	APPEALS
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JOSEPH F. RUGGIERO)	AND
Administrative Patent Judge)	
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